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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,433	11/12/2003	Kanya Ishizaka	117730	4586

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EXAMINER	
TORRES, JOSE	
ART UNIT	**PAPER NUMBER**
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/705,433	ISHIZAKA, KANYA	
	Examiner	Art Unit	
	Jose M. Torres	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33 and 35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,8-11,16-19,24-27,32,33 and 35* is/are rejected.

7)☒ Claim(s) *4-7, 12-15, 20-23, and 28-31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Comments

1. The Amendment filed on June 6, 2007 has been entered and made of record.

Claim Objections

2. Claim 16 is objected to because of the following informalities:

- Line 1: "16. (Original)" should be -- 16. (Currently Amended) --

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 8-11, 18 and 24-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Moon et al. (US 5,701,369).

Re claim 1: Moon et al. disclose an image processing apparatus for performing an image quality improving processing of an image, comprising: a domain block extracting section (FIG. 3, "control unit **20** and Range Block Memory **40**") for extracting a domain block image (FIG. 1 "Range Block Ri") from an original

image (FIG. 1, "composite image **100**") in the unit of a first block unit (Col. 3 lines 34-56); a range block extracting section (FIG. 3, "control unit **20** and Domain Block Memory **30**") for extracting a range block image (FIG. 1, "Domain Block D_J") from the original image in the unit of a second block unit which is larger than the first block unit with respect to the domain block image (Col. 3 lines 34-56); reduced range block forming section (FIG. 3, "control unit **20**") for reducing the extracted range block image to the size of the first block unit (Col. 5 lines 54-61); and an improved domain block forming section (FIG. 3, "control unit **20**") for performing a pixel value conversion with respect to the reduced range block image formed by the reduced range block forming section, and for outputting the pixel-value-converted reduced range block image as an improved domain block image (Col. 5 line 54 through Col. 6 line 29 and Col. 7 lines 31-36).

Re claim 2: Moon et al. disclose a similarity degree judging section (FIG. 3, "control unit **20**") for judging a similarity degree between the domain block image and the reduced range block image by the reduced range block forming section (Col. 6 lines 40-54), wherein the improved domain block forming section performs the pixel value conversion based upon the similarity degree obtained by the similarity degree judging section ("maximum degree of similarity", Col. 6 lines 55-61).

Re claim 8: Moon et al. disclose the range block extracting section extracts the range block image which contains the domain block image extracted by the domain block extracting section as the range block image (FIG. 4A, Col. 5 lines 28-41).

Re claim 9: Moon et al. disclose the range block extracting section extracts a plurality of the range block images with respect to one of the domain block images (FIG. 4, Col. 5 lines 28-36); the reduced range block forming section executes a reducing processing as to the plurality of range block images (Col. 5 lines 54-61); and the similarity degree judging section selects a reduced range block image which is judged as the image having the highest similarity degree with respect to the domain block image among a plurality of the reduced range block images ("maximum degree of similarity", Col. 6 lines 40-61).

Re claim 10: Moon et al. disclose when a pixel value "z" of the reduced range block image is least-squares-approximated ("least square method") to the pixel value of the domain block image by a linear transformation "az + b" (Equation (1)), the similarity degree judging section Judges the reduced range block image having the smallest least squares error ("optimal m and n") as a most resemblant reduced range block image having the highest similarity degree (FIG. 3, "slope and offset detector **50**" Col. 5 line 61 through Col. 6 line 39).

Re claim 11: Moon et al. disclose the improved domain block forming section forms the improved domain block image in such a way that the pixel value of the most resemblant reduced range block image is converted by the linear transformation "az + b" (Equation (1)) with employment of least squares coefficients "a" ("m") and "b" ("n"), which correspond to the most resemblant reduced range block image obtained by the similarity degree judging section (FIG. 3, "slope and offset detector **50**" Col. 5 line 61 through Col. 6 line 39).

Re claim 18: Moon et al. disclose an image processing method for performing an image quality improving processing of an image, comprising: extracting a domain block image ("range block") from an original image ("composite image") in the unit of a first block unit (FIG. 5, "step **501**" Col. 5 lines 28-33); extracting a range block image ("domain block") from the original image in the unit of a second block unit larger than the first block unit with respect to the domain block image (FIG. 5, "step **503**", Col. 5 lines 33-41); reducing a size of the extracted range block image to the size of the first block unit (FIG. 5, "step **507** Col. 5 lines 54-61); judging a similarity degree between the reduced range block image and the domain block image (FIG. 5, "step **513**", Col. 6 lines 40-54); and forming an improved domain block image based upon a result obtained by converting pixel values as to the reduced range block image based upon the similarity degree (Col. 5 line 54 through Col. 6 line 14 and Col. 7 lines 31-36)

Re claim 24: Moon et al. disclose the extracting of the range block image is performed in such a manner that the range block image contains the domain block image (FIG. 4A, Col. 5 lines 28-41).

Re claim 25: Moon et al. disclose when the range block image is extracted, a plurality of the range block images are extracted with respect to one of the domain block images (FIG. 4, Col. 5 lines 28-36); a reducing processing is performed as to the plurality of range block images respectively (Col. 5 lines 54-61); and a reduced range block image is selected which is judged as the image having the highest similarity degree with respect to the domain block image among a plurality of the reduced range block images ("maximum degree of similarity", Col. 6 lines 40-61).

Re claim 26: Moon et al. disclose when a pixel value "z" of the reduced range block image is least-squares-approximated ("least square method") to the pixel value of the domain block image by a linear transformation "az + b" (Equation (1)), the similarity degree judging processing is performed in such a manner that the reduced range block image having the smallest least square error ("optimal m and n") is judged as a most resemblant reduced range block image having the highest similarity degree (FIG. 3, "slope and offset detector **50**" Col. 5 line 61 through Col. 6 line 39).

Re claim 27: Moon et al. disclose a pixel value converting processing executed when the improved domain block image is formed is performed in such a manner that the pixel value of the most resemblant reduced range block image is converted by the linear transformation "az + b" (Equation (1)) with employment of least squares coefficients "a" ("m") and "b" ("n"), which correspond to the most resemblant reduced range block image obtained by the similarity degree judging section (FIG. 3, "slope and offset detector **50**" Col. 5 line 61 through Col. 6 line 39).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al. in view of Jacquin ("Fractal Image Coding: A Review", Proceedings of the IEEE, Vol. 81, No. 10, Oct. 1993, pp. 1451-1465). The teachings of Moon et al. have been discussed above.

As to claims 3 and 19, Moon et al. fails to disclose a domain block classifying section for classifying a sort of the domain block image extracted by the domain block extracting section, wherein the domain block image other than the domain block image

which has been classified to a previously determined sort is directly outputted as the improved domain block image.

Jacquin teaches a domain block classifying section ("Pools of Domain Blocks") for classifying a sort of the domain block image extracted by the domain block extracting section, wherein the domain block image other than the domain block image which has been classified to a previously determined sort is directly outputted as the improved domain block image (Section IV (B) "Pools of Domain Blocks", Page 1455, Cols. 1 and 2).

Therefore, in view of Jacquin, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Moon et al.'s system and method by incorporating the Pool of Domain Blocks in order to preserve the nature of the domain blocks under the application of any transformation (Section IV (B)).

7. Claims 16, 17, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al. in view of Bonneau et al. (US 6,002,794). The teachings of Moon et al. have been discussed above.

As to claims 16 and 32, Moon et al. further teaches the domain block extracting section extracts the domain block image in such a manner that the domain block image owns a cover portion on the original image (FIG. 1, Col. 3 lines 35-56).

However, Moon et al. fails to disclose an averaged value calculating section for calculating an average value with respect to pixels where a plurality of the improved domain block images are overlapped with each other.

Bonneau et al. teaches an averaged value calculating section for calculating an average value with respect to pixels where a plurality of the improved domain block images are overlapped with each other (FIG. 1, "step **107**", Col. 8 lines 36-63, FIG. 4 "domain blocks **401**" Col. 13 lines 30-52 and FIG. 18, "video encoding portion **1801**" Col. 25 lines 22-36).

Therefore, in view of Bonneau et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Moon et al.'s system and method by incorporating the video encoding portion to calculate an average value and where the improved domain blocks images are overlapped with each other in order to increase the compression ratio and allow a faster processing (Col. 18 lines 33-35).

As to claims 17 and 33, Moon et al. fails to disclose the original image corresponds to a color image, and the range block extracting section extracts the range block images from relatively same positions as to the respective color components of the original image.

Bonneau et al. teaches the original image corresponds to a color image (FIG. 19, Col. 26 lines 9-19), and the range block extracting section (FIG. 18, "video encoding portion **1801**") extracts the range block images from relatively same positions as to the respective color components of the original image (FIG. 1, "step **105**" Col. 8 lines 1-3, Col. 25 lines 22-36 and Col. 26 lines 20-48).

Therefore, in view of Bonneau et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Moon et al.'s system and method by incorporating the original image as a color image and the video encoding portion to extract the range block images from relatively same positions as the respective color components of the color image in order to achieve high compression, have selective and accurate feature preservation and is computationally efficient (Col.. 5 lines 64-67).

8. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al.

As to claim 35, Moon et al. disclose extracting a domain block image (FIG. 1 "Range Block Ri") from an original image (FIG. 1, "composite image **100**") in a size of a first block unit (Col. 3 lines 34-56); extracting a range block image (FIG. 1, "Domain Block D_J") from the original image in the unit of a second block unit larger than the first block unit with respect to the domain block image (Col. 3 lines 34-56); reducing a size of the extracted range block image to the size of the first block unit (Col. 5 lines 54-61); judging a similarity degree between the reduced range block image and the domain block image (Col. 6 lines 40-54); and forming an improved domain block image based upon a result obtained by converting pixel values as to the reduced range block image based upon the similarity degree ("maximum degree of similarity", Col. 6 lines 55-61 and Col. 7 lines 31-36).

However, Moon et al. does not explicitly teach a computer-readable storage medium storing a program for causing a computer to execute an image processing. Moon et al. does teach an image compression device comprising storage means, calculating means and control means (Claim 12), which corresponds to a memory and a processor. Since these type of computer devices are controlled by computer-implemented instructions, it would be apparent to one of ordinary skill in the art to implement the image processing device as taught by Moon et al. as a computer program stored on a computer readable storage.

Therefore, in view of Moon et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement Moon et al.'s image processing system as a computer program stored on a computer readable storage in order to accomplish a real time image processing system by reducing the number of the domain blocks to be evaluated (Col. 7 lines 31-36).

Allowable Subject Matter

9. Claims 4-7, 12-15, 20-23 and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The closest prior art of record failed to teach or suggest the domain block classifying section classifies the domain block image to a flat portion, a step edge portion, a noise portion, and a texture portion based upon both a standard deviation and

a concave/convex degree of the domain block and an edge emphasizing section for executing an edge enhancement processing with respect to the improved domain block image based upon both a relationship between a maximum value and a minimum value of the pixel values within the improved domain block images, and an edge degree of the improved domain block image.

Response to Arguments

Objections to the Specification

10. Page 17 line 1 has been amended to recite, "image quality is performed" to correct sentence grammar. Therefore, the objection has been removed.

Page 30 line 1 has been amended to recite, "edge portion may be reduced" to correct sentence grammar. Therefore, the objection has been removed.

Page 30 line 23 has been amended to recite, "a conversion error" to correct sentence grammar. Therefore, the objection has been removed.

Page 32 line 1 has been amended to recite, "the conversion error" to correct sentence grammar. Therefore, the objection has been removed.

Page 35 line 23 has been amended to recite, "(see Fig. 3F)" to correct figure number. Therefore, the objection has been removed.

Page 36 line 1 has been amended to recite, "memory region" to correct sentence grammar. Therefore, the objection has been removed.

Page 42 line 22 has been amended to recite, "It is apparent" to correct sentence grammar. Therefore, the objection has been removed.

Page 49 line 1 has been amended to recite, "domain block classifying section 32" to correct sentence grammar. Therefore, the objection has been removed.

Page 50 line 1 has been amended to recite, "a texture portion" to correct sentence grammar. Therefore, the objection has been removed.

Page 53 line 1 has been amended to recite, "the natural image" to correct sentence grammar. Therefore, the objection has been removed.

Page 54 line 1 has been amended to recite, "capable of enlarging" to correct sentence grammar. Therefore, the objection has been removed.

Page 56 line has been amended to recite, "the converting processing" to correct sentence grammar. Therefore, the objection has been removed.

Claim Rejection under 35 U.S.C. § 101

11. Claim 34 has been canceled. Therefore, the rejection has been removed.

Claim Rejections under 35 U.S.C. § 102

12. With respect to claims 1, 2, 8-11, 18 and 24-27, Applicant's arguments (Pages 20-22, Amendment filed on June 6, 2007) have been fully considered, but they are not persuasive.

Applicant's originally filed claim 1 recites, an image processing apparatus for performing an image quality improving processing of an image, comprising: a domain block extracting section for extracting a domain block image from an original image in the unit of a first block unit; a range block extracting section for extracting a range block

image from the original image in the unit of a second block unit which is larger than the first block unit with respect to the domain block image; a reduced range block forming section for reducing the extracted range block image to the size of the first block unit; and an improved domain block forming section for performing a pixel value conversion with respect to the reduced range block image formed by the reduced range block forming section, and for outputting the pixel-value-converted reduced range block image as an improved domain block image.

In other words, an apparatus that consists of four sections, two of which extracts a domain block and a range block image, a forming section for reducing the range image to the size of the domain image and a pixel value conversion section to perform a conversion with respect to the range image.

Applicant alleges that Moon et al. (US 5,701,369) does not teach or suggest "an improved domain section block forming section for performing a pixel value conversion with respect to the reduced range block image formed by the reduced range block forming section." (See Page 21 lines 3-6). Examiner respectfully disagrees. Furthermore, Applicant alleges that Moon et al. does not teach performing a pixel value conversion with respect to the spatially transformed domain block (See Page 21 lines 17-18).

Moon et al. teaches a control unit **20** that controls domain block memory **30** and spacially-transforms the domain block (D1) using a reduction ratio of ¼ so that all pixel data of the domain block (D1) corresponds to one-to-one with pixel data of range block (Ri) (See Col. 5 lines 54-61). Also, in equation (1), f (x, y) corresponds to gray scale

values of pixels (x, y) in the spacially transformed domain block and f' (x, y) corresponds to gray scale values of pixels (x, y) in the corresponding range block (See Col. 6 lines 13-25). Therefore, a pixel value conversion is being performed between the range and domain block data, which is similar to the claimed limitation of independent claim 1. The rejection is maintained (See Claim Rejections under 35 U.S.C. § 102 above).

With respect to claims 2, 8-11, 18 and 24-27, Applicant's arguments are no different from those presented with respect to claim 1, therefore, not persuasive. The rejections are maintained.

Claim Rejections under 35 U.S.C. § 103

13. With respect to claims 3, 16, 17, 19, 32, 33 and 35, Applicant's arguments are similar to those presented with respect to claim 1, therefore, not persuasive. See *Claim Rejections under 35 U.S.C. § 102* above. The rejections are maintained.

Allowable Subject Matter

14. Claims 4-7, 12-15, 20-23 and 28-31 stand objected as being dependent upon a rejected base claim.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jose M. Torres whose telephone number is 571-270-1356. The examiner can normally be reached on Monday thru Friday: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMT
07/30/2007

JINGGE WU
SUPERVISORY PATENT EXAMINER

Notice of References Cited	Application/Control No. 10/705,433	Applicant(s)/Patent Under Reexamination ISHIZAKA, KANYA	
	Examiner Jose M. Torres	Art Unit 2624	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,701,369	12-1997	Moon et al.	382/249
*	B	US-6,002,794	12-1999	Bonneau et al.	382/166
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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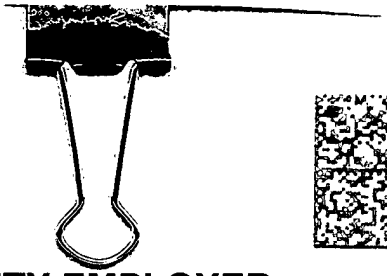

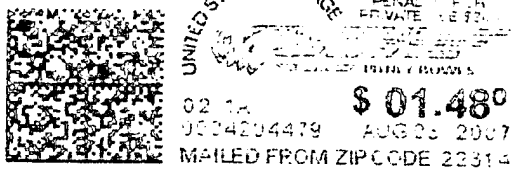
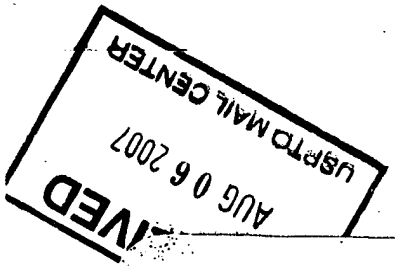
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